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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/777,309

02/13/2004

Shuichi Takei

118504

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12/22/2005

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EXAMINER

TRA, TUYEN Q

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/777,309

Applicant(s)

TAKEI, SHUICHI

Examiner

Tuyen Q. Tra

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 4, 10-12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1) in view of Lee et al. (US Patent 6,902,834 B2).

a) With respect to claims 1, 3, 4 and 18, Kido et al. discloses an organic electroluminescent device, group of organic electroluminescent devices in figure 1 comprising of an anodes (item 2); a cathode (item 6); a luminescent layer (item 4) emitting different colors of light and lying between the anode and cathode; and an electron injection layer (item 5) lying between a luminescent layer and the cathode(col. 8, lines 2-9). Kido et al. does not implicitly disclose a plural type of anodes, cathodes and luminescent layers, but it is inherent from Kido 's structure since making an array of displays such disclosed by applicant would require the use plurality of anode, cathode and luminescent layers in Kido device. However, Kido et al. does not disclose the electron injection layer including a first metal compound and a second metal compound and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals and

rare earth metals. Within the same field of endeavor, Lee et al. discloses an organic electroluminescence device with teaching of an electron injection layer including a metal oxide represented by formula 1 formed between the light-emitting layer and the cathode. Formula 1 is  $MA_xMB_yO_z$ , where MA denotes an alkali metal or alkali earth metal, MB is a group IV or V metal (such Ti, Zr, Hf, Nb, Ta) (see abstract and col. 3, lines 10-20).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct organic electro-luminescence display element with metal layers for electron injection layer such as disclosed by Kido et al., with the electron injection layer including at least a first metal compound and a second metal compound, and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals, and rare earth metals such as discloses by Lee et al., for purpose of forming electron injection layer.

b) With regard to claim 10-12, it should be noted that although claims 10-12 are "method claims", the method steps consist of the broad steps of "providing", "applying" etc and therefore these steps would be inherently satisfied by the apparatus of the reference as modified.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1) in view of Lee et al. (6,902,834) as applied to claim 1 above, and further in view of Nii (US 6,555,959 B1).

Kido et al. in view of Lee et al. discloses an organic electroluminescent device, group of organic electroluminescent devices in figure 1 comprising of an anodes (item 2); a cathode (item 6); a luminescent layer (item 4) emitting different colors of light and lying between the anode and cathode; and an electron injection layer (item 5) lying between a luminescent layer and the cathode, the electron injection layer including a first metal compound and a second metal compound and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals and rare earth metals (col. 8, lines 2-9).

However, Kido et al. and Lee et al. do not disclose both the first metal compound and the second metal compound being one of a fluoride an oxide and a chloride of the metal element. Within the same field of endeavor, Nii discloses a material for light emitting device, light emitting device using thereof, and amine compound with teaching of a first metal compound and a second metal compound being one of a fluoride an oxide and a chloride of the metal element (col. 35, line 64-col. 36, line 9).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct an organic electroluminescent device, group of organic electroluminescent devices with metal compound electron injection layer such as disclosed by Kido and Lee et al., with an oxide and a chloride of the metal element such as discloses by Nii for purpose of transporting electron.

4. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1) in view of Lee et al. (6,902,834 B2), as applied to claim 1 above.

Kido et al. discloses an organic electroluminescent device, group of organic electroluminescent devices in figure 1 comprising of an anodes (item 2); a cathode (item 6); a luminescent layer (item 4) emitting different colors of light and lying between the anode and cathode; and an electron injection layer (item 5) lying between a luminescent layer and the cathode, the electron injection layer including a first metal compound and a second metal compound and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals and rare earth metals (col. 8, lines 2-9).

However, Kido et al. in view of Lee et al. do not disclose method of how to deposit plurality of metal compounds on the electro-optic device. The method of depositing metal layer to the device is not germane to the issue of patentability of the device itself. Therefore, it is obvious to one skill in the art at time invention was made to use various way or method to deposit the metal layers for purpose of making such the electrooptic device and therefore this limitation have not given patentable weight.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1), in view of Lee et al. (6,902,834 B2) as applied to claim 10 above, in view of Himeshima et al. (US 6633124B2).

Kido et al. in view of Lee et al. disclose an organic electro-luminescence display element, finder screen display device, finder and optical device in Fig. 4 comprising of electrodes (items 1, 5) opposing each other; plural types of luminescent layers emitting different colors of light and lying between the electrodes (col. 12, lines 26-34); and an

electron injection layer (item 4) lying between the electrodes (1, 5), the electron injection layer (4) including a plurality of metal compounds (col. 7, lines 20-29).

However, Kido et al. in view of Lee et al. do not disclose method for depositing metal elements according to chemical bond force. Within the same field of endeavor, Himeshima et al. discloses process for producing an organic electroluminescent device with teaching of method for forming metal layers according to chemical bond force (col. 14, lines 20-36).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct organic electro-luminescence display element with metal layers for electron injection layer such as disclosed by Kido et al. in view of Lee et al., with metal layers formed according to chemical bond force such as discloses by Himeshima et al., for purpose of forming electrode injection layer.

6. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1) in view of Lee et al. (US 6,902,834 B2), as applied to claims 1 and 10 above, in view of Sato et al. (US 6,534,202 B2).

Kido et al. in view of Lee et al. disclose an organic electro-luminescence display element, finder screen display device, finder and optical device in Fig. 4 comprising of electrodes (items 1, 5) opposing each other; plural types of luminescent layers emitting different colors of light and lying between the electrodes (col. 12, lines 26-34); and an electron injection layer (item 4) lying between the electrodes (1, 5), the electron injection layer (4) including a plurality of metal compounds (col. 7, lines 20-29).

However, Kido et al. in view of Lee et al. do not disclose method for depositing metal elements according to chemical bond force. Within the same field of endeavor, Sato et al. discloses organic electroluminescent device and process for producing the same with teaching of method for forming cathode of a metal reducing the metal compound (Alkali metals have a high reducing ability) (col. 3, lines 25-28).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct organic electro-luminescence display element with metal layers for electron injection layer such as disclosed by Kido et al. and Lee et al., with method for forming cathode of a metal reducing the metal compound such as discloses by Sato et al., for purpose of reducing energy barrier.

7. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 6,589,673 B1) in view of Lee et al. (US 6,902,834 B2), as applied to claim 10 above, in view of Aziz et al. (US 6,811,896 B2).

Kido et al. in view of Lee et al. discloses an organic electro-luminescence display element, finder screen display device, finder and optical device in Fig. 4 comprising of electrodes (items 1, 5) opposing each other; plural types of luminescent layers emitting different colors of light and lying between the electrodes (col. 12, lines 26-34); and an electron injection layer (item 4) lying between the electrodes (1, 5), the electron injection layer (4) including a plurality of metal compounds (col. 7, lines 20-29).

However, Ueda et al. does not disclose method for depositing metal elements according to chemical bond force. Within the same field of endeavor, Aziz et al. in view



of Lee et al. disclose organic light emitting device (OLED) with thick (100 to 250 nanometers) porphyrin buffer layer with teaching of method for forming metal layers according to valences of metals elements (col. 14, lines 20-36).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct organic electro-luminescence display element with metal layers for electron injection layer such as disclosed by Kido et al. in view of Lee et al., with metal layers formed according to valences of metal elements such as discloses by Aziz et al., for purpose of forming electrode injection layer.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US 6,614,176 B2) in view of Lee et al. (US 6,902,834 B2).

Kim et al. discloses an Organic electroluminescent device including charge transport buffer layer in Figure 3 comprising of a plurality of anodes (item 32); a first luminescent layer (item 34) formed above at least one of the plurality of anodes (32); a second luminescent layer (item 34') formed above the other of the plurality of anodes (32); an electron injection layer (item 35a) formed corresponding to the first luminescent layer (item 34) and the second luminescent layer (34') in common; and a cathode (item 36) formed above the electron injection layer (item 35a).

However, Kim et al. does not disclose the electron injection layer (item 35a) including at least a first metal compound and a second metal compound, and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals, and rare earth metals. Within the same field of endeavor, Lee et al. discloses an organic

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electroluminescence device with teaching of an electron injection layer including a metal oxide represented by formula 1 formed between the light-emitting layer and the cathode. Formula 1 is  $MA_xMB_yO_z$ , where MA denotes an alkali metal or alkali earth metal, MB is a group IV or V metal (such Ti, Zr, Hf, Cu, V, Nb, Ta) (see abstract and col. 3, lines 10-20).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct organic electro-luminescence display element with metal layers for electron injection layer such as disclosed by Kim et al., with the electron injection layer including at least a first metal compound and a second metal compound, and both the first metal compound and the second metal compound including a metal element selected from the group consisting of alkali metals, alkaline earth metals, and rare earth metals such as discloses by Lee et al., for purpose of forming electron injection layer.

#### ***Allowable Subject Matter***

9. Claim 20 is allowed.

The reason for the indication of allowable subject matter is that an electron injection layer formed corresponding to the first luminescent layer and second luminescent layer in common, the electron injection layer including Lithium and Strontium disclosed in the claims is not found in the prior art.

#### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343.

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The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (571) 272 - 2328. The fax number for this Group is (703) 872-9306.

TT

December 15, 2005



Hong-Ming Deng  
Primary Examiner